Gas Springs
Overview

Gas Springs
· High pressure gas (Nitrogen gas: non-combustible) is sealed in a cylinder, and the gas reaction force is used as spring. Because this small gas spring receive small spring constant from large initial load in spite of its size, it can be used for wide range of applications including machines, furniture, cars, office automation equipment, etc.

Feature
· In spite of its size and weight, large spring (reaction) force can be obtained.
· Spring (reaction) force is almost constant throughout its stroke.

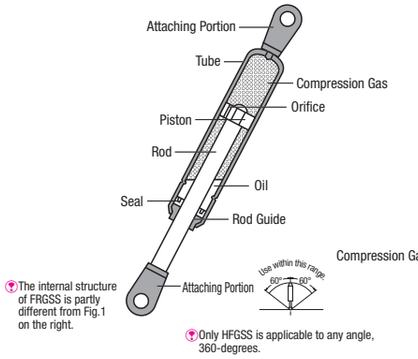


Fig.1 Gas Springs (FGS, GSS, HFGSS, FRGSS)

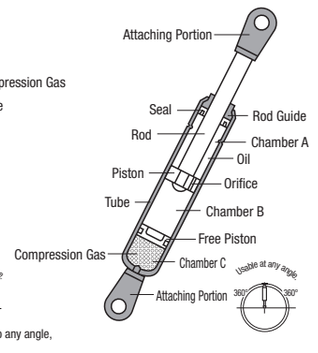
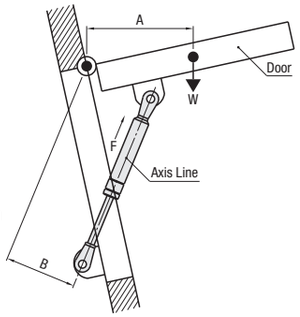


Fig.2 Gas Springs – Mounting Orientation Free Type (FGSS)

About Initial Selection
1. Calculate the necessary reaction force (F) through the following formula, then find out possible model types.

$$F = \frac{W \times A}{B}$$

F: Necessary Reaction Force (at Max. Length)
W: Weight of Doors, etc.
A: Horizontal Distance between Fulcrum (Door Hinge, etc.) and the Center of Gravity
B: Vertical Distance between Fulcrum (Door Hinge, etc.) and the Axis of Gas Spring



2. Select Fx1.1 or more for the gas spring reaction force. Gas reaction forces may vary within about ±10%.
3. If required reaction force (Fx1.1) is larger than the reaction force at the max. length of gas spring -( ) mm, use 2 or more springs.
4. Reaction forces are designed at 20°C. Reaction forces increase or decrease as the temperature changes.

Gas reaction force at the max. length -10 (5) mm and the max. length -(S) mm are listed in this catalog. Gas reaction force generally changes proportionately. If the gas reaction force on a certain stroke is required, connect the 2 points with a straight line as shown in Fig. 3 and extrapolate the stroke value.

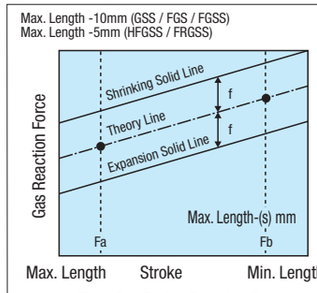


Fig.3 Gas Spring Reaction Force

f= Internal Sliding Resistance (Theoretical Value x0.1)

Precautions for Use (for FGS, GSS, FGSS, HFGSS and FRGSS)
· Pay attention to temperature of gas springs during use. Do not store for prolonged duration. It will cause premature seal deterioration and reaction force decline. (Product Temperature Range: GSS, FGSS: -20°C~60°C / HFGSS: -20°C~80°C / FRGSS: -30°C~80°C Some products have different temperature range. Confirm for each product page.)
· Gas reaction forces are slightly different among individual products and may change depending on the temperature.
· Reaction force may decrease depending on the operating condition and times of use. Please replace it when it cannot reach the necessary reaction force.
· Do not store or use in the environments where the rod may rust, or in chemical atmosphere. Furthermore, do not paint the gas spring.
· Do not damage the cylinders and rods. If rods are wrapped with tape or plastic strings, adhesives or fibers remained on the surface will come inside, resulting in gas / oil leakage. Be sure to see if there is no rust, scratches, adhesives and foreign objects on the rod before use.
· Do not apply forces like bending load and torsion. Receiving load only with gas springs results in unbalanced load, which causes early deterioration and gas/oil leakage. For rotating motion, be sure to secure smooth sliding on the hinge. For linear motion, install a guide, etc. to prevent unbalanced load.
· Do not extend gas springs beyond its max. length. Even in the max. stroke (during compression), it must remain about 10mm away from the stroke end. Do not extend and compress at high speeds (with 1m/s or more).
· Use FGS and GSS with the cylinder side up and the rod side down, so that internal oil protects the rubber seal. For FGS, GSS and FRGSS, do not tilt more than 60 degrees. When it is necessary to temporarily store, do not tilt more than 60 degrees.
· Although there is no restriction in the use angle for the FGSS and HFGSS, rod downward is recommended.

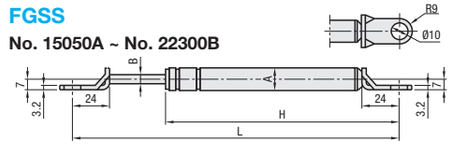
About Final Selection
· Load may vary depending on door angles or gas spring mounting positions. Calculate the reaction force moment based on the subject design drawing.

Features of Mounting Orientation Free Gas Springs (FGSS)
· Mounting Orientation Free Gas Springs
1. Nitrogen gas (non-combustible) is sealed in the gas chamber C with a free moving piston intervening, and gas reaction force is used as a spring.
2. Gas chamber C has a constant reaction force in extending direction since it pressurizes oil chamber AB. Therefore the size of reaction force depends on the inner pressure of gas chamber C.
3. When rod moves from the predetermined position, oil in chamber AB moves through orifice hole of the piston.
4. The rod volume change in the cylinder is adjusted by the change of gas chamber C.

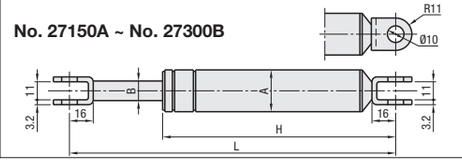
Gas Springs
Mounting Orientation Free Type

FGSS

No. 15050A ~ No. 22300B



No. 27150A ~ No. 27300B



Operating Temperature: -20~60°C
M Material:
Cylinder: 1008 Pipe Steel
(Carbon Steel Hollows for Machine Structural Use)
Rod: 1020 Carbon Steel
Gas: Nitrogen Gas (N_2)
S Surface Treatment:
Cylinder: Baked-On (Black Matt)
Rod: Hard Chrome Plating

Part Number Type	No.	Max. Length Lmax	Min. Length Lmin	Stroke	Gas Reaction Force (20°C) Lmax. -10mm Stroke Fa N	Fa kgf	Lmax. -(S)mm Stroke Fb N	Fb kgf	(S)	A	B	H	Applicable Mounting Bracket	Weight (g)	Unit Price 1~9 pc(s).	Volume Discount Rate 10~14	15~19
FGSS	15050A	246	196	50	49	5	69	7	40	15	7	164	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P.364)	125			
	15050K				70	7.1	90	9.1									
	15050B				98	10	127	13									
	15080A	330	250	80	49	5	69	7	70			218		150			
	15080B				98	10	127	13									
	15090A	360	270	90	49	5	69	7	80			238		155			
	15090B				98	10	127	13									
	15100A	386	286	100	49	5	69	7	90			254		170			
	15100B				98	10	127	13									
	18100A	386	286	100	196	20	255	26		18	8	253		210			
	18100B				294	30	382	39									
	18150A	526	376	150	196	20	265	27	140			343		280			
	18150B				294	30	392	40									
	22050A	246	196	50	196	20	265	27	40	22	10	163		215			
	22050B				294	30	402	41									
	22050C				392	40	529	54									
	22050D				490	50	655	66									
	22080A	330	250	80	196	20	274	28	70			217		270			
	22080B				294	30	412	42									
	22080C				392	40	539	55									
	22080D				490	50	675	68									
	22090A	360	270	90	196	20	265	27	80			237		280			
	22090B				294	30	402	41									
	22090C				392	40	529	54									
	22090D				490	50	659	67									
	22100A	386	286	100	196	20	274	28	90			253		305			
	22100B				294	30	412	42									
	22100C				392	40	549	56									
	22120A	440	320	120	196	20	274	28	110			287		320			
	22120B				294	30	402	41									
	22120C				392	40	539	55									
	22120D				490	50	672	68									
	22130A	470	340	130	196	20	274	28	120			307		330			
	22130B				294	30	402	41									
	22130C				392	40	539	55									
	22150A	526	376	150	196	20	274	28	140			343		400			
	22150B				294	30	402	41									
	22150C				392	40	539	55									
	22180A	610	430	180	196	20	274	28	170			397		420			
	22180B				294	30	402	41									
	22180C				392	40	539	55									
	22200A	666	466	200	196	20	265	27	190			433		480			
	22200B				294	30	402	41									
	22200C				392	40	529	54									
	22250A	750	500	250	196	20	304	31	240			467		540			
	22250B				294	30	451	46									
	22250C				392	40	598	61									
	22300A	850	550	300	196	20	323	33	290			517		600			
	22300B				294	30	490	50									
	27150A	526	376	150	490	50	657	67	140	27.4	12.5	351		610			
	27150B				588	60	784	80									
	27150C				686	70	921	94									
	27200A	666	466	200	490	50	657	67	190			441		760			
	27200B				588	60	784	80									
	27200C				686	70	921	94									
	27250A	750	500	250	490	50	725	74	240			475		900			
	27250B				588	60	872	89									
	27250C				686	70	1019	104									
	27300A	850	550	300	490	50	774	79	290			525		1000			
	27300B				588	60	931	95									

For Mounting Brackets, see **P.364** and **365**.

For orders larger than indicated quantity, please request a quotation.

Ordering Example: Part Number FGSS15050A

Days to Ship

Configure Online